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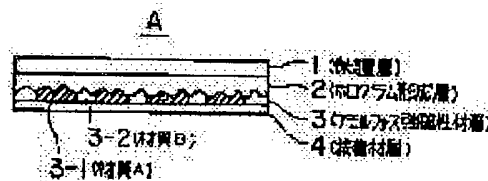
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## (54) INFORMATION RECORDING MEDIUM

## (57)Abstract:

PROBLEM TO BE SOLVED: To obtain an information recording medium simultaneously having the ease of discriminating forgery and the difficulty of forgery and alteration by depositing an amorphous ferromagnetic material layer on a hologram forming layer consisting of a resin by sputtering, etc.

SOLUTION: This information recording medium has a protective layer 1 consisting of a polyethylene transparent resin having a thickness of about several tens  $\mu\text{m}$ . The embossing type hologram forming layer 2 on which embossing patterns are written and has a thickness of about several  $\mu\text{m}$  is, for example, a UV curing type UV resin. The amorphous ferromagnetic material layer 3 having a thickness of about several tens  $\mu\text{m}$  is deposited by sputtering and evaporation on the hologram forming layer 2 and is formed as a reflection layer. The amorphous ferromagnetic material layer 3 is formed by sputtering using a ternary or quaternary alloy essentially consisting of cobalt Co or iron Fe as a target material. The alloy varying in the history characteristics of Hc (coercive force),  $\mu$  (magnetic permeability), Bm (saturation magnetic flux density) and B-H characteristic (hysteresis curve) is used. Further, the recording medium is provided with an adhesive material layer 4 for adhering the medium to paper, cards, etc.



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DETAILED DESCRIPTION

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## [Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention is held in the object inside of the body like instruments and a prepaid card as a cure against an insurance guarantee of the body, and relates to the information record medium with which administration object information is recorded magnetically.

[0002]

[Description of the Prior Art] It is shown in JP,6-286368,A "a record carrier card and its truth judging equipment" which the invention-in-this-application person etc. proposed that it is effective to use the amorphous ferromagnetic film as instruments or forged preventive measures of a prepaid card. On the other hand, it is known well that a copy can do neither the card with which the hologram was given, nor a gift certificate, and that it is also effective in forged prevention from the point which the manufacture can be special and cannot be manufactured easily [refer to O puls E 1989 year 8 month number pp 96-100 and Fujiro Iwata "printing of a hologram"]. However, since the security was dependent on vision to the last, it was impossible in machine reading [refer to JP,7-302319,A "the approach of the improvement in card dependability by holography, and the card according to private seal"]. In order to improve this, the device which raises security nature from the magnetic-recording medium using the usual coercive force and a hologram, using complexly the pattern (data) by which reading appearance is carried out is made.

[0003]

[Problem(s) to be Solved by the Invention] Although it is a deterrent to be unable to forge the product using holography easily by a color copy etc., but for distinction of a counterfeit to have an easy advantage, and to need a special printing technique, in current, it becomes that it is easy to be forged by the approach of the mass-production-method sense having been developed and having become cheap, and the forged prevention effectiveness is falling. Moreover, since the alteration of magnetic-recording information is easy also for the structure which combined general magnetic recording, it cannot be said to be so advanced forged prevention structure.

[0004] The object of this invention is to offer the information record medium which has the distinction ease of a counterfeit, and the difficulty of forgery and an alteration simultaneously.

[0005]

[Means for Solving the Problem] In order to attain this object, the information record medium of this invention is considered as the configuration which put the amorphous ferromagnetism material layer on the hologram formative layer which consists of resin by the spatter etc. The content of record can be read in this information record medium with the information reader which consists of a means to read the information written to the amorphous ferromagnetism material layer.

[0006]

[Embodiment of the Invention] The spatter of the front face of the plastics layer by which hologram formation was carried out can be carried out by amorphous ferromagnetism material, and a reflecting layer can be formed, or metal layers, such as aluminum, can be made to be able to intervene

independently, a reflection effect equivalent to usual aluminum can be given, and an amorphous ferromagnetic layer can be concealed. Information can be written in an amorphous ferromagnetic layer and information can be read with an easy means from the exterior. The information record medium by this invention is held in the object inside of the body like instruments and a prepaid card as the forged preventive measures. thus, rewriting of the information on the amorphous ferromagnetism material of the formed object inside of the body is impossible, it is possible to give the singularity of magnetic properties, and a forged prevention function is boiled markedly and improves.

[0007] [Example] The example of this invention is explained to a detail with reference to a drawing. Drawing 1 is the information record medium A by the first example of this invention, and 1 is a protective layer which consists of polyethylene system transparence resin which has the thickness of about dozens of micrometers. 2 is the embossing-die hologram formative layer which has the thickness of about several micrometers in which the embossing pattern was written, for example, is ultraviolet curing form UV resin. 3 is an amorphous ferromagnetism material layer which has the thickness of about dozens of micrometers, on the hologram formative layer 2, carries out spatter vacuum evaporation and is taken as the reflecting layer. By making an alloy into target material, this amorphous ferromagnetism material layer 3 is what carried out spatter processing, and what of 3 yuan which used Cobalt Co or Iron Fe as the principal component, or 4 yuan has Hc (holding power),  $\mu$  (permeability), unique Bm (saturation magnetic flux density), and the unique hysteresis property of a B-H property (hysteresis curve) is used for it. 4 is a binder layer for pasting up this information record medium on paper, a card, etc. 3-1 and 3-2 are a part of amorphous ferromagnetic layers, and construction material A (3-1) and construction material B (3-2) show the condition that the information which magnetic properties differ or is meaningful with the existence of a magnetic layer is written, respectively.

[0008] Drawing 2 is \*\*\*\*\*B by the second example of this invention, and the information hiding layer 5 for concealing that the amorphous ferromagnetism material layer 3 is formed between the amorphous ferromagnetism material layer 3 and the hologram formative layer 2 is formed. This information hiding layer 5 is formed of vacuum evaporation of non-magnetic materials, such as an aluminum aluminum ingredient, and turns into a reflecting layer. Thus, by forming, there is an advantage that it can conceal so that the amorphous ferromagnetism material layer 3 in which data were written cannot be identified visually.

[0009] Drawing 3 is the information record medium C by the third example of this invention, is the example which made the information record media A and B the shape of a hot printing film, and sandwiches the thermoplastics 6 which is a remover between a protective layer 1 and the hologram formative layer 2. By using this thermoplastics 6, it is effective in the ability to print a hologram required for the location of the arbitration on this information record medium C.

[0010] Drawing 4 is what showed the information write-in example by the hologram pattern and amorphous ferromagnetism material to the information record medium 11, the pattern pattern 12 is a hologram pattern and the bar code pattern 13 is the example of information which changed the magnetic properties of amorphous ferromagnetism material, or was written in by processing of existence. It sticks and uses for paper, a card, etc., and also the information record medium 11 is a thread-like, and by plow lump, insertion hold of it can be carried out and it can be used for paper.

[0011] Although drawing 5 is the example of the information reader from the information record medium by this invention, the detail of the information reader in this application is indicated by "the record carrier card and its truth judging equipment" (JP,6-286368,A) which the invention-in-this-application person etc. proposed previously. 7 is an exiting coil which excites the amorphous ferromagnetism material layer 3, and 8 is an excitation power source. Excitation is excited by the 5kHz - 20kHz sine wave. 9 is a magnetometric sensor which detects the flux density change from the excited amorphous ferromagnetism material layer 3, and is changed into an electrical potential difference. A magnetometric sensor 9 and an exiting coil 7 may use the differential mold magnetic head in order to be unified and to remove an excitation signal component. 10 is amplifier and amplifies the feeble signal from a magnetometric sensor 9.

[0012] Since the amorphous ferromagnetism material layer 3 which drawing 6 is the sectional view (a)

for explaining the principle of operation of a reader, a wave form chart (b), and (c), and was excited from the exterior usually has hysteresis TERISHIRI with nonlinear impression magnetic field strength and flux density of the magnetic substance magnetized by the field from the magnetic properties, a detection electrical potential difference produces the distorted wave form depending on the magnetic properties of the proper of amorphous ferromagnetism material. As shown in drawing 6, the wave of little shape of a distorted sine wave and the wave of many shape of distorted BARUSU are detected by the difference in magnetic properties. If a magnetometric sensor 9 is moved, the information written to each amorphous ferromagnetism material layer 3 will change one after another, and reading appearance will be carried out. A deformation amount is distinguished by the filter circuit combined with amplifier 10, for example, if it is defined as "0" when there are few deformation amounts, it is defined as "1" when many, and it changes, it will be obtained as information which is meaningful as binarization information. Moreover, since a deformation amount is peculiar to an amorphous magnetic material, distinction of whether this ingredient is a true product is possible for it by analyzing the magnitude of harmonic content. An analog filter is combined, A/D conversion can be carried out and analysis can be performed by the approach of carrying out FFT analysis. In addition, there is also a method of changing thickness as a means which writes information in amorphous ferromagnetism material. By this approach, information is acquired as amplitude change of a detection electrical potential difference by which reading appearance is carried out. On the other hand, detection of the pattern pattern 12 by the hologram contrasts the master pattern to own and the hologram pattern printed by the information record medium 11 visually, and judges truth. Thus, it is easily detectable visually.

[0013]

[Effect of the Invention] Magnetic properties which are different in a hologram according to this invention as explained to the detail above Or since magnetic information can be written in by carrying out the spatter vacuum evaporation of the amorphous ferromagnetism material which changed thickness instead of the reflective film It has the advantage that information can read with easy read-out equipment in addition to visual effectiveness, and there is outstanding effectiveness that forgery can offer a very difficult information record medium, from the singularity of magnetic properties further.

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